EXHIBIT A-17

Newton's Telecom Dictionary (Dkt. 29-17)

EXHIBIT 17
Excerpt from Harry Newton, Newton's Telecom Dictionary (21st ed. 2005)

NEWTON's TELECOM DICTIONARY

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LMEI / Load Balance

on the top of apartment buildings. Each of 12 transmitters in the boroughs of Manhattan, Brooklyn, Queens and portions of The Bronx covers an area of 28 square miles. At that high frequency, line-of-sight is required for maximum signal performance. This necessity for line-of-sight is the reason it wasn't installed in Manhattan (too many tall buildings). The received LMDS signal is often then distributed through the building's central CATV system. It also can be used to broadcast directly to a subscriber's home via an 18" flat antenna sitting in the subscriber's window. There are actually all sorts of variations on the LMDS theme. In one trial, the service was used for high-speed Internet downloads to LMDS subscribers—the Internet downloads coming from LMDS, the command to initiate those downloads being sent from the subscriber's PC over his local phone line. There is R&D going on at present to enable LMDS to carry two-way voice conversations. In Brazil, CellularVision uses LMDS technology, transmitting in the FM range, which means the signal has the ability to bounce, and to reflect off virtually any surface, thereby avoiding issues of line-of-sight and increasing the coverage area significantly. Two-way or interactive communication may be inserted between video channels for transmission back on the opposite polarity. This reverse polarization, or interweaving, theoretically allows simultaneous use of signals at the same frequency for two applications. LMDS is competitive with conventional cable-based CATV. In March 1997, the FCC set aside total LMDS bandwidth of 1.15 GHz in the 28-GHz, 30-GHz and 31-GHz frequency bands. The intent is to use LMDS for its original intended purpose of WLL (Wireless Local Loop). LMDS is competitive with conventional cable-based CATV. See also ADML, Broaband Wireless Local Loop, LMCS, MMDL, MMDS and Wireless Local Loop (WLL).

LMEI Layer Management Entity Identifier.

LMHost LMHhost is a text file which contains the NetBIOS name and IP addresses of other computers on a network. Microsoft Windows Network is a NetBIOS-based network where each computer is given a unique name, the NetBIOS name. In a traditional NetBIOS name, each machine sends a NetBIOS broadcast that announces its name as it boots. If another host already exists with that name, it will send a message to the new client saying that that name is in use. If it doesn't get a message back, the client assumes that the name is available. One of the ways to get around this broadcast problem is to create a text file named LMHost on every computer. Not a recommended course of action.

LMI 1. Local Management Interface. A specification for the use of frame-relay products that define a method of exchanging status information between devices such as routers.

2. Logical Modem Interface. The core of the Microsoft Fax interface. LMI lets third-party licensed vendors write plug-in modules to provide instant and transparent access to diverse underlying systems. An easy analogy for the LMI is to consider the Windows print manager. To the user, simply installing the printer driver suited to their printer is all that is required. According to Microsoft, "The LMI interface provides a similar layer between the internal fax components of Windows 95 and the fax hardware or, in our case, the fax server."

LML Lineup Maintenance Level.

LMOS Loop Maintenance Operations System.

LMP A Bluetooth term. Link Manager Protocol. The LMP is used for peer-to-peer communication.

Lmp Authentication A Bluetooth term. An LMP level procedure for verifying the identity of a remote device. The procedure is based on a challenge-response mechanism using a random number, a secret key and the BD_ADDR of the non-initiating device. The secret key used can be a previously exchanged link key or an initialization key created based on a PIN (as used when pairing).

Lmp Pairing A Bluetooth term. A LMP procedure that authenticates two devices based on a PIN and subsequently creates a common link key that can be used as a basis for a trusted relationship or a (single) secure connection. The procedure consists of the steps: creation of an initialization key (based on a random number and a PIN), mutual authentication based on the initialization key and creation of a common link key.

LMS 1. Local Message Switch.

2. Loop Monitoring System.

LMSS Land Mobile Satellite Service.

LMU Line Monitor Unit.

LNA Low Noise Amplifier.

LNB Low Noise Block converter. The device at the focal point of the satellite dish that gathers the signal reflected by the dish to the system's low-noise block amplifier.

LNC Low Noise Converter.

LND Last Number dialed.

LNNI LANE Network-to-Network Interface. An ATM term for the standardized interface protocol between LANE (LAN Emulation) servers (LES-LES, BUS-BUS, LECS-LECS and LECS-LES). See also LANE and LUNI.

LNP Local Number Portability. Similar in concept to 800/888 and other toll-free number portability, LNP was mandated by the Telecommunications Act of 1996 to level the playing field between the ILECs (Incumbent Local Exchange Carriers) and the CLECs (Competitive Local Exchange Carriers). In July 1996, the FCC issued a ruling that LNP must be in place nationwide by January 1, 1998. Since each state is responsible for implementation of LNP, timetables vary; the specifics of the implementations vary, as well.

In some states, the implementation approach is exactly like that for 800 (toll-free) number portability. In other words, the originating central office "dips" into a centralized database of numbers via an signaling system 7 (SS7) data link. The database, known as a SCP (Service Control Point) in IN (Intelligent Network) terms, identifies the LEC (local exchange carrier) providing service to the target telephone number in order that the originating carrier can hand the call off to the terminating carrier.

In other states, such as Illinois, which is the first to implement LNP, a totally different approach is taken. This implementation involves the use of a new 10-digit telephone number, known as a LRN (Local Routing Number). When the originating CO switch consults the SCP, the new 10-digit number is provided along with the identification of the CLEC to which the service has been ported. The originating carrier then hands off the call to the CLEC. While this approach is claimed to be faster, clearly two telephone numbers are required, thereby placing additional pressure on the North American Numbering Plan (NANP).

To implement LNP, the FCC has mandated a system of regional databases, which will store master copies of all porting information. These databases will be maintained by regional Number Portability Administration Centers (NPACs) that will serve as number portability clearinghouses for all local operators. Originally, the deal was that Lockheed Martin would maintain the databases in four regions and Perot Systems in three regions. After Perot had some problems getting going on time, Lockheed Martin was selected to run all seven. That responsibility now rests with NeuStar, which was an independent business unit within Lockheed Martin before being spun off.

In either case, LNP will require the SCPs to be established by LECs, CLECs, IXCs (interexchange carriers) and wireless carriers. Further, the SCPs must be synchronized in order that the databases are consistent across them all. The concept is simple, but its implementation is complex and expensive. MNP (Mobile Number Portability) is the LNP version intended for eventual use in certain mobile networks. See also Number Portability and Trigger. www.NeuStar.com

LNPA Local Number Portability Administration. See also LNP and NANC.

LNRU Like New Repair and Update. A term in the industry which repairs telecom equipment. It means all equipment is repaired and updated to the current manufacturer's specifications. New plastic is used to refurbish to a "like new" status. Also added are a new coil cord, line cord and address tray. Included is a full diagnostic test with a burn-in (if required) and an operational system test. Definition courtesy Nitsuko America. See also Repair And Quick Clean and Repair, Update And Refurbish.

LO Local Operator. In the PCS sense, a functional entity providing local wireless service to customers in a geographical region. The LO (Local Operator) is serviced by the National Services Organization in the PCN (Personal Communications Network) for long-distance communications and for marketing/sales.

LOA Letter Of Agency. A letter that you give to someone whom you allow to represent you and act on your behalf. For example, a letter of agency is used when your interconnect company orders lines from your local phone company on your behalf. Letters of Agency are also used when companies switch their long distance service from one carrier to another. A blanket LOA can mean everything from a group of numbers belonging to one customer at multiple sites or multiple customers at multiple sites.

load 1. The act of taking a program or data from external storage—a cassette, a floppy or hard disk, etc. and storing it in the computer's main RAM memory.

2. The load is any electric or electronic appliance or gadget plugged into an AC electrical outlet. It completes the circuit from the transformer through the hot conductor, to the load, through the neutral conductor and back to the utility transformer. See AC, AC Power, Ground and Grounding.

load balance A telephone company term. Load Balance is the even distribution of customer traffic volume across all loading units in a switching entity. Load Balance is not related to the absolute level of load, but only to how well the existing load is distributed. See also Load Balancing.

Load Balance Index LBI. A telephone company term. Indicates trends, identifies superior performances and points up opportunities for improvement in load balance administration of dial Central Office line equipment.

load balancer In server farms, a load balancer accepts IP packets and then distributes them among identical web servers. This enables the manager to add web servers as loads grow, or to take a server out of service and not have the clients notice. This definition contributed by Alan Simmons. See also Load Balancing.

load balancing The practice of splitting communication into two (or more) routes. By balancing the traffic on each route, communication is made faster and more reliable. In telephone systems, you can change phone and trunk terminations in order to even out traffic on the network. An example: You have a PBX of three separate cabinets, each of which are joined by tie lines. Instead of having each cabinet serve anyone in the building, you might figure which groups talk to each other the most and concentrate them into specific cabinets. The objective is to maximize the number of calls that can be handled inside each cabinet and reduce the number of calls that need to travel between the cabinets. This makes the calls go faster and reduces the need for inter- cabinet lines.

In data internetworking, bridges and routers perform load balancing by splitting LAN-to-LAN traffic among two or more WAN links. This allows for the combination of several lower speed lines to transmit higher speed LAN data simultaneously. In local area networking, load balancing is a function performed by token ring routers. In data networking, load balancing can also be a form of inverse multiplexing where data packets are alternated over all available circuits. At the receiving end, the packets are reassembled in their proper order.

In disk arrays, load balancing means using multiple power supplies within a disk array so that power usage is spread equally across all the power supplies. The failure of one supply will not cause the entire array to fail. See also Load Balancer.

load coil Load coils are also known as impedance matching transformers. Load coils are used by the telephone companies on long analog POTS (Plain Old Telephone Service) lines to filter out frequencies above 4 kHz, using the energy of the higher frequency elements of the signal to improve the quality of the lower frequencies in the 4 kHz voice range. Load coils are great for analog voice grade local loops, but must be removed for digital circuits to function. Load coils must be removed for DSL loops, as the frequencies required are well above 4 kHz.

load coil detector A device use to detect unseen load coils on a wire pair. See Load Coil.

load factor Ratio of the Peak to Average ratio over a designated time period; has meaning in both traffic engineering and in transmission technology, particularly for data transmission.

load leveling Load can apply to telecommunications traffic or electricity (AC or DC). Load leveling in telecom typically means distributing traffic over more than one route. Load leveling in electricity typically means

load number Load number is the Canadian equivalent of the U.S. concept of Ringer Equivalence. The idea is that each phone or "phone thing" you buy (e.g. answering machine) comes with a number. You add the numbers together and if you get above a certain number, you are drawing too much current and none of the bells on the phones will ring. In Canada, single line phones are typically rated at 10 for the newer ones with electronic "bells" or 20 for the older electro-mechanical ones with real metal bells. In Canada, the rule is not more than 100 points on a line. In the U.S., phones are typically one and the rule is not more than five points on a line.

load service curves The output from load and stress testing on a computer telephony system is a set of load service curves. Load service curves identify how individual areas of the system respond under various load amounts. Traffic is provided to the computer telephony system at defined steps (perhaps at 1,000 call per hour increments) until the system design threshold is reached. Measurements are taken at each step, and usually shown graphically, in a "curve". Most computer telephony systems are designed to handle up to a specified number of busy hour calls with specific response times. For example, the time that passes between the point in time a caller enters a DTMF digit and the point the computer telephony system speaks a response should usually be no more than 1 second 97% of the time, nor more than 3 seconds 99% of the time. A load service curve would be used to illustrate the response time at each step of increasing load. When the load curve shows the response time is slower than the above parameters, the system has reached its capacity. Of course, the load placed on the system must accurately mimic the real world load the system will experience or it is largely meaningless. This definition from Steve Gladstone, president, Hammer Technologies, makers of fine computer telephony testing

systems, 508-694-9959.

load sharing In data processing, load sharing is the technique of using two computers to balance the processing normally assigned to one of them. In local area networking, load sharing is performed by token ring routers when connecting remote LANs. It allows combining Ethernet and Token Ring traffic over a common WAN (Wide Area Network) link such as T-1 or 56 Kbps circuit. Loads sharing eliminates the need for duplicate WAN links (and bridges or routers) each serving a different type of LAN.

load testing Also known as stress testing, the goal of load testing is to make sure the system will meet or exceed its busy hour load capacity objectives under all operating conditions. This requires stressing the system in incremental steps until it breaks and understanding what happens when the system is operating under its full rated transaction load? Beyond its load? Does it slow down? How? Does it fail? Where? How is service restored after an outage? Is service restoration graceful or must the system reboot? Is restart manual or will the system reset itself? Individual load tests may be performed to understand the impact of load on specific system bottlenecks. Most significant architectural problems will come to light under load testing. It is critical that any load placed on a computer telephony system be dynamic, and mimic the load characteristics the system will experience under real-world usage and conditions. See also Dynamic Load Testing and Load Service Curves.

loaded cable Twisted wire pair into which inductors have been inserted at periodic intervals to approximate the optimum ratios of the primary cable constants for minimum loss. A loaded cable acts like a lowpass filter. Transmission loss below the cutoff frequency is reduced below that for the nonleaded cable and is nearly flat. Above the cutoff frequency, loss increases very rapidly. See Loading.

loaded line A telephone line equipped with loading coils to add inductance in order to minimize amplitude distortion. See Loading and Loading Coil.

loaded loop Also called a Loaded Pair (loaded twisted pair); a loop that contains series inductors, typically spaced every 6000 feet for the purpose of improving the voiceband performance of long loops. However, high bandwidth DSL operation over loaded loops is not possible because of excessive loss at higher frequencies. See Loading.

loading A method of improving the voice quality of a phone line. Telephone companies put load coils on local lines. What this loading does is to insert inductance in a local loop circuit to offset the effect of capacitance in the cable. Loading "tunes" the circuit to the voice frequency band (500 to 2500 Hz) and thus improves the quality at the expense of overall bandwidth. You usually have to ask that the loading coils be removed if you're planning to transmit high-speed data exclusively on that circuit. See Loading Coil.

loading coil See Load Coil.

loading division A telephone company term. A group of the same type of equipment designed to be loaded similarly by both usage and classes of service.

loading high A memory management verb for loading a device driver or TSR (Terminate and Stay Resident) program into upper memory, out of conventional memory. Under DOS, the loading high commands are DEVICEHIGH for device drivers and LOADHIGH (or LH) for TSRs. Third party memory managers use their own routines to load high, though they can sometimes borrow DOS commands.

loading plan A telephone company term. A Loading Plan is a systematic scheme for fully utilizing all existing capacity in a given switching entity; Utilizing and coordinating the capabilities and capacity limitations of various entities in a multi-entity wire center and maintaining objective service levels at all times. A Loading Plan is the basis for achieving and retaining good Load Balance.

LOC An ATM term. Loss of Cell Delineation: A condition at the receiver or a maintenance signal transmitted in the PHY overhead indicating that the receiving equipment has lost cell delineation. Used to monitor the performance of the PHY layer.

local Pertaining to a system or device that resides within a subject device's switching domain. **Localmon.dll** The standard print monitor for use with printers connected directly to your computer. If you add a printer to your computer using a serial or parallel port (such as COM1 or LPT1), this is the monitor that is used.

local access The connection between a customer's premises and a point of presence of the Exchange Carrier.

Local Access and Transport Area LATA. The MFJ (Modified Final Judgement), which broke up the Bell System, also defined 196 distinct geographical areas known as LATAs. The LATA boundaries generally were drawn in consideration of SMSAs (Standard Metropolitan Statistical Areas), which were defined by the Census Bureau to identify "communities of interest" in economic terms. Generally speaking, the LATA bound-

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phones momentarily break the DC circuit (stop current flow) to represent the digits dialed. The circuit is broken three times for the digit 3. The CO counts these evenly-spaced breaks and determines which digit has been dialed. You can hear the "clicks". The number "seven," for example consists of seven "opens and closes," or seven clicks. You can dial on a rotary phone without using the rotary dial. Simply depress the switch hook quickly, allowing pauses in between to signify that you're about to send a new digit. It's a good party trick.

rotary dial calling The telephone system will accept dialing from conventional rotary dial sets.

rotary hunt You buy several phone lines. Let's say 212-691-8215, 212-691-8216, 212-691-8217, 212-691-8218. Someone dials you on your main number—212-691-8215. It's busy. (That's our number.) The central office slides the call over to 212-691-8216. If that number is busy, it slides it over to 212-691-8217, and so on. This is called rotary hunt. It hunts to the next line in the rotary group. In the old days, the phone lines you could rotary hunt to had to be in numerical sequence. But now with modern stored program control central offices, your lines in rotary hunt con be very different as long as they're all on the same exchange.

rotary output to central office Most central offices are equipped to provide tone dial service. In cases where the telephone company central office trunks are not designed to accept tone signaling, your on premise phone system (PBX, key system or single line phone) will translate the number entered by a phone in tones into rotary dial pulses which can be processed by the central office.

rotating cylinder (Drum) scanner A scanning technique using a drum and a photocell scan head. The original is attached to the drum, enabling the scan head to travel along the length of the document. Reflected light from the document is concentrated on the scanner photocell, which causes an analog signal.

rotating helical aperture scanner Original is illuminated by a lamp when led onto the platen, via a mirror and lens system, the document's image is focused first through a fixed horizontal slot, then through a rotating spiral slit disk series, and finally onto a photocell to generate an analogous electrical current.

rotational latency The delay time from when a disk drive's read/write head is on-track and when the requested data rotates under it.

rotational mailboxes Information only mailboxes whose information is automatically changed on a time sensitive or usage sensitive basis.

ROTFL I'm "Rolling on the Floor, Laughing." Used in e-mail.

ROTL 1. Remote Office Test Line. Provides the capability to originate automatic inter office trunk transmission test calls under the automatic control of CAROT from a remote location.

2. A popular online abbreviation, shorthand for "Rolling On The Floor Laughing"; an appropriate typed response to a particularly amusing online remark. Other common Net acronyms include IMHO ("In My Humble Opinion") and IMNSHO ("In My Not-So-Humble Opinion").

rotor The rotating part of a motor or other electrical machines.

ROTS Rotary Out-Trunk Switches.

round cutter These are used to cut cables. The blades of the cutter are curved so that there is a space between them.

round robin This is a method of distributing incoming calls to a bunch of people. This method selects the next agent on the list following the agent that received the last call. See also Top Down and Longest Available.

Round-Trip Time See RTT.

roundtrip propagation delay Roundtrip propagation delay from a burst modem to a burst modem will be about 470 milliseconds to 570 milliseconds (About half a second). See Satellite Transmission Delay.

routable protocols Protocols, such as TCP/IP, DECnet, and XNS, that support Network Layer addressing. Packets constructed using these protocols contain information about how data should move through a network. This information, carried in the NLA (Network Layer Address) field of the packet, is used by internetworking devices to make routing decisions.

route The path that a message takes. In telephone companyese, a route is the particular trunk group or interconnected trunk groups between two reference points used to establish a path for a call. This term (or the term routing) is also used as a verb to define the act of selecting a route or routes.

route 66 A colloquial term for the Internet, with something interesting everywhere along the way. Route 66 used to be the way we drove across America before they put in concrete highways.

route advance This feature routes outgoing calls over alternate long distance lines when the first choice trunk group is busy. The phone user selects the first choice route by dialing the corresponding access code. The phone equipment automatically advances to alternate trunks and trunk groups, based on the user's class of service. Route advance is a more primitive form of least cost routing. See Least Cost Routing.

route caching A type of load sharing in a which an application is assigned to a particular one of several parallel transmission circuits.

route control Route control technology lets a company identify the most efficient ISP and sends Internet traffic to that ISP. Border Gateway Protocol (BGP) routes are continually updated by route control devices to maintain optimal traffic paths. This is how it works: Route control devices measure real-time, end to end performance for each ISP. Traffic flows over the fastest path, as determined by the route control device. Devices update BGP routes. ISP performance and traffic results are reported by the route control device.

route daemon A program that runs under 4.2 or 4.3BSD UNIX systems (and derived operating systems) to propagate routes among machines in a local area network. Pronounced "route-dee."

route discovery Process through which a brouter can learn LAN topology by passing information about its address and the LANs it connects and receiving the same information from others.

route diversity See Diversity.

route flap Route flap describes the impact of frequent changes in state (i.e., condition and availability) of Internet routes. The changes in state are generated by routers that sense (either correctly or incorrectly) that there are problems across one or more routes that connect them to their peers. In such an event, they generate route change messages that are sent to their peers. Route flaps can be caused by events such as BGP (Border Gateway Protocol) session resets between routers, changes in state (e.g., on or off) of a router, changes in state (e.g., up or down) of a circuit, changes in router filter lists, and high error rates over a particular link or circuit interconnecting two routers. These frequent changes cause a state of confusion as packets are routed first this way and then another way, like a flag flapping in the wind.

route guide A map showing how calls are to be routed at the switch: first choice group of circuits, second choice, third choice, and fourth choice.

route hut A physical site along the a route, particularly a fiber route, where the transmission is boosted.

route indexing Provision of Interim Number Portability through direct trunks equipped for CCIS/SS7 operation, which are provisioned between end offices of Verizon and a CLEC. Inbound traffic to a ported number is routed over these trunks.

route indicator An address or group of characters in the heading of a message defining the final circuit or terminal to which the message is to be delivered.

route length The actual length of a route, or path, between transmitter and receiver. The length of the route is one factor that determines propagation delay, i.e., the delay associated with a signal as it transverses a network. Route length is determined by measuring the actual length of a the path, rather than the distance "as the crow flies."

route list A sequence of trunk groups that can be searched for a particular route. This list is comprised of trunk groups and configuration attributes (e.g. Class of Service) governing the use of a particular trunk group.

route mile Let's say that you have two sheaths of fiber, each of which contains ten fibers and runs for one mile. That is one route mile (total distance of all fibers), two sheath miles (2 sheaths running one mile), and twenty fiber miles (20 fibers running one mile).

route optimization 1. In voice communications, route optimistization is another another way of saying least cost routing, which is

2. In data communications—such as the Internet - the concept refers to devices called route optimizers which peer into the Internet and fathom efficient ways of sending their information through it. Some route optimizers use the BGP—Border Cateway Protocol. Other simpler ones take advantage of utilization thresholds, minimizing the need for BGP expertise. Route optimizers are used by webmasters especially when they maintain multiple, distant identical web servers. There's a fine art to using route optimizers on the Internet. They're often difficult to manage, but they're probably invaluable if you have o large network.

route optimizer From Network World: Organizations with branch offices are con-

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